EXECUTIVE SUMMARY

This feasibility study (FS) has been prepared to identify and evaluate possible remedial alternatives for Operable Unit 4 (OU 4) at Hill Air Force Base (Hill AFB). Hill AFB is located in northern Utah about 25 miles north of Salt Lake City and about five miles south of Ogden. The Base was placed on the National Priority List in July 1987. Operable Unit 4, one of seven operable units at Hill AFB, has been identified in the Federal Facility Agreement as Landfills 1 and 2, the Spoils Pit, the North Gate Dump Area, and the Munitions Dump. This FS is based on data collected by the U.S. Geological Survey (USGS) and presented in the Remedial Investigation (RI) Report for Operable Unit 4 (USGS, 1992) and the RI Addendum (USGS, 1992a).

Except for the North Gate Dump Area where several drums of waste solvents were reportedly dumped, there are no records of hazardous materials being disposed of in any of these locations. Trichloroethene (TCE) contamination of the ground water downgradient from Landfill 1 has been identified, and the RI identified Landfill 1 as the only source of TCE at OU 4. Landfill 2, the Spoils Pit, and the Munitions Dump do not appear to be sources of subsurface contamination. Suspected areas of road-side dumping of TCE (the North Gate Dump Area) have not been located or confirmed by the RI.

Trichloroethene has been identified as the primary contaminant of concern, and it has been detected in ground-water samples, subsurface soil samples, and soil gas. TCE in soil gas has probably volatilized from the water table because no soil sources have been found, and a strong correlation exists between the soil-gas concentrations and ground-water contamination.

The primary exposure pathway has been identified as ingestion, inhalation, and dermal adsorption of TCE from contaminated ground water. Exposure to contaminated surface water (seeps) also has been identified as a potential health risk, although current land and surface-water use do not make this a primary concern. A potential exposure pathway of inhalation of TCE vapors within residences has also been identified as a potential health risk if the soil gas plume expands and diffuses into basements of nearby residents.

This FS report evaluates and screens available process options and technologies for four medium-specific areas of attainment: shallow ground water, surface water in the form of seeps, landfill contents and adjacent soil, and air. Selected processes are then assembled into sets of medium-specific alternatives that are analyzed in detail according to the nine National Contingency Plan (NCP) criteria. A no action and a limited action alternative are developed for each medium-specific set. The no action alternatives generally consist of monitoring, and the limited action alternatives generally include some form of access restriction and land acquisition. None of these no action or limited action alternatives comply with applicable or relevant and appropriate requirements (ARARs), except for Air Alternatives 1 and 2. These air alternatives comply with ARARs because contaminated air has not been detected in residences. Future movements of either the contaminated ground-water or soil-gas plume could result in residential air contamination and require that air alternatives be re-evaluated.

Three treatment alternatives were developed for ground-water remediation in addition to no action and limited action. These recommended treatment alternatives encompass collection and treatment by air stripping and ultraviolet oxidation, followed by discharge to the Weber River or the local publicly owned treatment works (POTW) and passive treatment by metal-enhanced reductive dehalogenation. These alternatives provide protectiveness and potential compliance with ARARs, and the five balancing criteria are also satisfied. The two modifying criteria, community and state acceptance, will be met after public comment and review of the document by regulatory agencies. In-situ treatment, other than metal-enhanced reductive dehalogenation, of the ground water has been eliminated because of minimal effectiveness due to heterogeneous lithology, low permeability clays, and preferential flow paths. A containment alternative has not been considered directly because the two treatment alternatives are likely to achieve containment with additional benefits.

Three alternatives were developed for surface-water remediation in addition to no action and limited action. These three alternatives cover direct treatment by granular activated carbon (GAC) adsorption or reductive dehalogenation, and collection, treatment, and discharge in conjunction with potential ground-water alternatives. If seep flow rates continue as observed, the direct treatment alternatives appear to best meet the criteria, unless surface-water remediation can be combined with ground-water remediation. Because several of the seeps have dried up since the Davis-Weber Canal was relined this spring, a no action or limited action alternative is very favorable with the contingency for direct treatment if seep flow remains uniform or increases during wetter years.

Containment, in-situ treatment, and excavation alternatives were developed for remediation of the landfill contents. Capping with a clay or multi-media cap meets ARARs, protects human health and the environment, and rates well against the five balancing criteria. If a more active remediation of the source is considered, vapor extraction has been included as an in-situ treatment alternative. This alternative is more costly than simple capping, but it allows for eventual elimination of the source without the added risks and costs of extracting the hazardous wastes. Excavation and disposal of the landfill contents to a Resource Conservation and Recovery Act (RCRA) permitted facility provides long-term protection to human health and the environment, but its short-term effectiveness is less than the other alternatives due to risks associated with removal and transportation of landfill materials through populated areas.

As mentioned above, air contamination of nearby residences with TCE has not yet been detected. Under the current situation, the no action or limited action alternatives are very favorable in that they meet all the NCP evaluation criteria. Either of these two alternatives could be selected if air contamination does not present a risk. If expansion of the soil-gas or ground-water plumes result in the future detection of TCE in local residences, a collection and treatment alternative has been developed. This alternative would be protective of human health and the environment by eliminating the exposure pathway for indoor air contamination.

The resulting set of medium-specific alternatives allows for considerable flexibility in selecting the site remedy. These alternatives allow for selecting a remedy best suited for the

remediation objectives while allowing contingencies to handle remaining uncertainties. One possible combination of these alternatives might include landfill containment, ground-water treatment with ultraviolet (UV) oxidation, and no action for surface water and air. Active surface-water and air alternatives could be built into the overall site remedy as contingencies if ground-water collection and treatment do not eliminate the seeps or contain the soil vapor plume.